

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 14123 (1994): Sodium Ascorbate, Food Grade [FAD 8: Food Additives]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



भारतीय मानक

सोडियम एस्कोर्बेट, खाद्य ग्रेड — विशिष्ट

Indian Standard

SODIUM ASCORBATE, FOOD GRADE —
SPECIFICATION

UDC 664.094.382 : 547.475.2

© BIS 1994

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

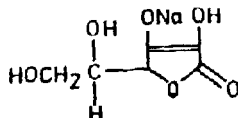
FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Food Additives Sectional Committee had been approved by the Food and Agriculture Division Council.

With the increased production of processed foods, manufacturers have started adding a large number of substances, generally in small quantities, to improve the appearance, flavour, texture or storage properties of the processed foods. As certain impurities in these substances could be harmful, it is necessary to have a strict quality control of these food additives. A series of standards has, therefore, been prepared by this Bureau to cover purity and identification of these substances. These standards help to check purity at the stage of manufacture, for it is extremely difficult (and in many cases impossible) to detect the impurity once these substances have been added to the processed foods. Besides, these standards are intended to guide the indigenous manufacturers in making their product conform to specifications that are accepted by scientists, health authorities and international bodies.

Sodium ascorbate is a white to yellowish crystalline solid. It is used as an antioxidant and as a nutrient for diet supplementation.

Sodium ascorbate is also known as Vitamin C sodium, and sodium L-ascorbate. Its molecular weight is 198.11, empirical formula $C_6H_7NaO_6$ and structural formula as given below:



In the preparation of this standard considerable assistance has been derived from Food Chemical Codex, National Academy of Sciences, Pub. National Research Council, Washington DC. USA 1981.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SODIUM ASCORBATE, FOOD GRADE — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for sodium ascorbate, food grade.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	Title
1070 : 1992	Water for general laboratory use (<i>third revision</i>)
1699 : 1994	Methods of sampling and test for food colours (<i>second revision</i>)

3 REQUIREMENTS

3.1 Description

Sodium ascorbate shall be a white to yellowish crystalline solid. One gram is soluble in 2 ml of water.

3.2 Identification

3.2.1 A 1 in 50 solution slowly reduces alkaline cupric tartarate solution at 25°C, but more readily upon heating. Alkaline cupric tartarate is made by mixing exactly equal volumes of copper solution (*A*) and alkaline tartarate solution (*B*) at the time required. The solutions (*A*) and (*B*) are made as given below:

Copper solution (*A*) : Dissolve 34.66 g of carefully selected small crystals of cupric sulphate, $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ showing no trace of efflorescence or of adhering moisture, in sufficient water to make 500 ml. Store this solution in small, tight containers.

Alkaline tartarate solution (*B*) : Dissolve 173 g of crystallized potassium sodium tartarate $\text{KNaC}_4\text{H}_4\text{O}_6 \cdot 4\text{H}_2\text{O}$ and 50 g of sodium hydroxide, NaOH , in sufficient water to make 500 ml. Store this solution in small alkali resistant containers.

3.2.2 To 2 ml of a 1 in 50 solution of the sample acidified with 0.5 ml of 0.1 N hydrochloric acid add 4 drops of methylene blue solution (125 ml of methylene blue dissolved in 100 ml alcohol and volume made up to 250 ml) and warm to 40°C. The deep blue colour shall be practically discharged within 3 minutes.

3.2.3 Dissolve 15 mg of the sample in 15 ml of a 1 in 20 solution of trichloroacetic acid, add about 200 mg of activated charcoal, shake

vigorously for 1 minute and filter through a small fluted filter, returning the filtrate, if necessary until clear. To 5 ml of the filtrate add 1 drop of pyrrole, agitate gently until dissolved and then heat in a water bath at 50°C. A blue colour shall develop.

3.2.4 A solution of the sample previously converted to chloride or nitrate (by acidifying a two percent *m/v* aqueous solution with N hydrochloric acid or nitric acid) when mixed with five times its volume of cobalt uranyl acetate upon shaking give a golden yellow precipitate. This indicates presence of sodium.

3.3 Specific Rotation [°C] D^{25}_D

The specific rotation at 25° of a 10 percent (*m/v*) solution of the sample in water shall be between +103° to +108°.

3.4 The pH of a one in ten solution shall be 7.5 ± 0.3 .

3.5 The material shall also conform to the requirements given in Table 1.

4 PACKING, STORAGE AND MARKING

4.1 Packing

The material shall be filled in well-closed, light-resistant containers.

4.2 Storage

The material shall be stored in a cool and dry place.

4.3 Marking

4.3.1 Each container shall be legibly and indelibly marked with the following:

- a) Name of the material including the words 'food grade';
- b) Source of manufacture;
- c) Minimum net mass of the contents;
- d) Batch or code number;
- e) Date of manufacture; and
- f) Any other details required as per the *Standards of Weights and Measures (Packaged Commodities) Rules, 1977/ Prevention of Food Adulteration Rules, 1955.*

4.3.2 BIS Certification Marking

The container may also be marked with the Standard Mark.

Table 1 Requirements of Sodium Ascorbate
(*Clauses 3.5 and 6.1*)

Sl No. (1)	Characteristic (2)	Requirement (3)	Method of Test, Ref to (4)
i)	Assay as $C_6H_7NaO_6$ (on dry basis), percent by mass	99.0 to 101.0	A-1
ii)	Loss on drying, percent by mass, <i>Max</i> , after drying in vacuum over phosphorus pentoxide at 60° for 4 hours	0.25	—
iii)	Heavy metals (as Pb), mg/kg, <i>Max</i>	20	A-2
iv)	Lead (as Pb), mg/kg, <i>Max</i>	10	15 of IS 1699 : 1994
v)	Arsenic (as As), mg/kg, <i>Max</i>	3	15 of IS 1699 : 1994

4.3.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

5 SAMPLING

Representative samples of the material shall be drawn and conformity of the material to the requirements of this specification shall be determined according to the procedure prescribed in 4 of IS 1699 : 1994.

6 TESTS

6.1 Tests shall be carried out by the methods as specified in 3.2, 3.3, 3.4 and col 4 of Table 1.

6.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070 : 1992) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the experimental results.

ANNEX A

[*Table 1, Sl No. (i) and (iii)*]

METHOD OF TEST FOR SODIUM ASCORBATE, FOOD GRADE

A-1 ASSAY

A-1.1 Reagents

A-1.1.1 Sulphuric Acid, Dilute — 10% (*m/v*).

Prepare by cautiously adding 57 ml of sulphuric acid (95 to 98%) to about 100 ml of water. Cool to room temperature and dilute with water to 1 000 ml.

A-1.1.2 Starch Solution

Mix 1 g of suitable starch with 10 mg of red mercuric oxide and sufficient cold water to make a thin paste. Add 20 ml of boiling water, boil for 1 minute with continuous stirring and cool. Use only clear solution.

A-1.1.3 Iodine Solution — 0.1 N.

A-1.2 Procedure

Dissolve about 400 mg sample, previously dried over phosphorus pentoxide for 24 hours and

accurately weighed, in a mixture of 100 ml of water, recently boiled and cooled and add 25 ml of dilute sulphuric acid and titrate with 0.1 N iodine, adding starch solution near the end point (each ml of 0.1 N iodine is equivalent to 9.905 mg $C_6H_7NaO_6$).

A-2 HEAVY METALS

A-2.1 Reagents

A-2.1.1 Ammonia Solution

Dilute 400 ml of ammonium hydroxide (28 percent) to 1 000 ml with water.

A-2.1.2 Hydrochloric Acid — 10 percent.

A-2.1.3 Lead Nitrate Stock Solution

Dissolve 159.8 mg of lead nitrate in 100 ml of water containing 1 ml of nitric acid. Dilute with water to 1 000 ml and mix. Prepare and store the solution in lead-free glass containers.

A-2.1.4 Standard Lead Solution

Dilute 10 ml of lead nitrate stock solution, accurately measured, with water to 100 ml. Each ml of the solution so prepared contains the equivalent of 10 µg of lead ion (Pb).

A-2.1.5 Nitric Acid — 10 percent.**A-2.1.6 Sulphuric Acid — 94.5 to 95.5 percent.****A-2.1.7 Acetic Acid — 6 percent.****A-2.1.8 Hydrogen Sulphide**

A saturated solution of hydrogen sulphide made by passing H₂S in cold water.

A-2.2 Procedure**A-2.2.1 Solution A**

Take 2 ml of the standard lead solution in 50 ml Nessler tube and add 23 ml of water. Adjust the pH to between 3.0 to 4.0 by addition of acetic acid or ammonia solution. Dilute with water to 40 ml and mix.

A-2.2.2 Solution B

Place one gram of the sample, accurately weighed, in a suitable crucible. Add sufficient

nitric acid to wet the sample, and carefully ignite at a low temperature until thoroughly charred, covering the crucible loosely with a suitable lid during the ignition. After the substance is thoroughly carbonized, add 2 ml of nitric acid and 5 drops of sulphuric acid, and cautiously heat until white fumes are evolved. Then ignite, preferably in a muffle furnace, at 500 to 600°C until the carbon is completely burnt off. Cool and add 4 ml of dilute hydrochloric acid, cover the crucible and digest sample on a steam-bath for 10 to 15 minutes. Uncover, and slowly evaporate the sample to dryness on a steam-bath. Moisten the residue with one drop of hydrochloric acid, add 10 ml of hot water and digest for 2 minutes. Add dropwise, ammonia solution until the solution is just alkaline to litmus paper. Dilute with water to 25 ml and adjust the pH to between 3.0 and 4.0 (pH indicator paper) by the addition of dilute acetic acid. Filter if necessary and wash the crucible and the filter paper with 10 ml of water. Transfer to a 50-ml nessler tube. Dilute the combined filtrate and washings with water to 40 ml and mix.

A-2.2.3 To each tube add 10 ml of freshly prepared hydrogen sulphide. Mix and allow to stand for 5 minutes and view over a white surface. The colour of solution B shall not be darker than that of Solution A.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition.

This Indian Standard has been developed from Doc : No. FAD 8 (357)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices:

Telephone

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002

{ 331 01 31
 331 13 75

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola
CALCUTTA 700054

{ 37 84 99, 37 85 61
 37 86 26, 37 86 62

Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036

{ 53 38 43, 53 16 40
 53 23 84

Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113

{ 235 02 16, 235 04 42
 235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
BOMBAY 400093

{ 632 92 95, 632 78 58
 632 78 91, 632 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE.
FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR.
LUCKNOW. PATNA. THIRUVANANTHAPURAM.